FILTERED AIR

Its Importance in Building Ventilation and Air Conditioning

FILTERED AIR

ITS IMPORTANCE IN BUILDING VENTILATION AND AIR CONDITIONING

2nd Printing — 1933
3rd Printing — 1934
4th Printing — 1935
5th Printing — 1937
6th Printing — 1939

AMERICAN AIR FILTER COMPANY, INC.
Incorporated
LOUISVILLE, KENTUCKY

© FAIRCHILD AERIAL SURVEYS INC. N. Y. C.

ROCKEFELLER CENTER

Corbett, Harrison & MacMurray, Hood & Fouilhoux, and Reinhard & Hofmeister, *Architects.*
Clyde R. Place, *Consulting Engineer.*
Almirall & Co., Baker Smith & Co., Carrier Engineering Corp., Gillis & Geoghegan, Inc., and Wolff & Munier, *Ventilating and Air Conditioning Cont.*

ROCKEFELLER CENTER, generally called Radio City because it houses the headquarters and principal studios of the National Broadcasting System, is a group of buildings which comprise the world's greatest air conditioning and ventilating project. Although not yet completed, the systems now in service total more than 2,000,000 C.F.M.

Not only has it been engineered with meticulous care and thoroughness but on the newer buildings the engineers have had the added advantage of several years' operating experience with the equipment installed in the first buildings erected.

American Air Filters, together with other makes were used in the original buildings, Nos. 1 and 9, but in subsequent buildings, Nos. 2, 3, 8 and 10 as well as in the newest units Nos. 4-A, 4-B, 5, 6 and 7, American Air Filters have been used exclusively.

AMERICAN AIR FILTER INSTALLATIONS IN ROCKEFELLER CENTER

BLDGS. NO. 1 AND NO. 9

American	Multi-Panel	199,150 C.F.M.

BLDG. NO. 3 (BRITISH BLDG.)

American	Multi-Panel	217,700 C.F.M.

BLDG. NO. 5

American	Multi-Panel	195,000 C.F.M.
American	Renu-Mat	12,800 C.F.M.

BLDG. NO. 10

American	Airmat	180,000 C.F.M.
American	Multi-Panel	124,000 C.F.M.

BLDG. NO. 2 (FRENCH BLDG.)

American	Multi-Panel	42,500 C.F.M.
American	Renu-Vent	60,000 C.F.M.

BLDG. NO. 7

American	Multi-Panel	168,000 C.F.M.

INTERNATIONAL BLDG.

American	Renu-Mat	62,000 C.F.M.

BLDG. NO. 8

American	Airmat	150,000 C.F.M.

BLDGS. NO. 4A, 4B AND 6

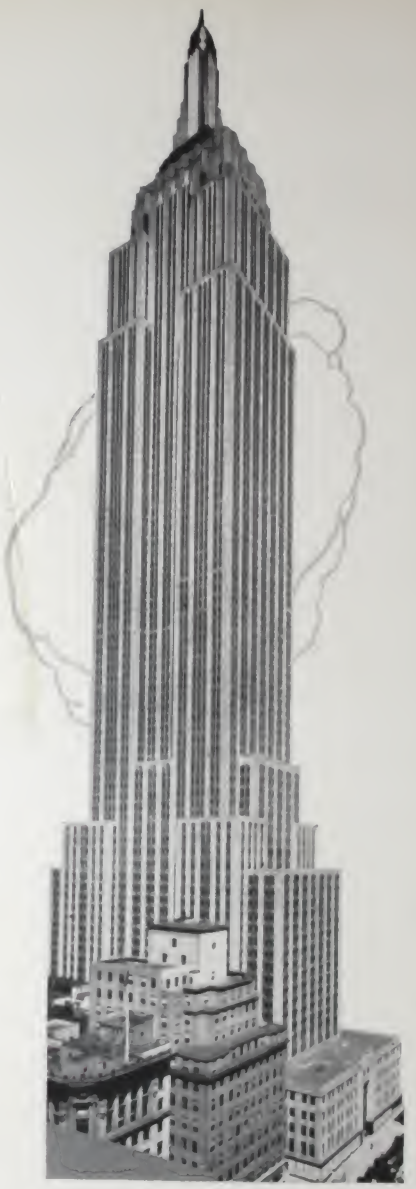
American	Multi-Panel	185,150 C.F.M.
American	Renu-Vent	36,300 C.F.M.
Total Capacity American Air Filters		1,351,600 C.F.M.

THE WORLD'S TALLEST BUILDING

THE EMPIRE STATE, typical of the modern office building, is ventilated with filtered air. A total of 620,000 cu. ft. per minute is required for the 1st to 14th floors and the sub-basements. Every 56 minutes the American Air Filters clean a volume of air equal to the total displacement of the building.

Some other well known office buildings served by American Air Filters:

Boody Bldg.	*Toledo, Ohio*
Boston Herald Traveler Bldg.	*Boston, Mass.*
Carrier Engr. Corp. Office Bldg.	*Syracuse, N. Y.*
Chrysler Bldg.	*New York, N. Y.*
DuPont Bldg.	*Wilmington, Dela.*
Lincoln-Liberty Bldg.	*Philadelphia, Pa.*
Los Angeles Stock Exchange	*Los Angeles, Calif.*
New York Stock Exchange	*New York, N. Y.*
Oliver Bldg.	*Pittsburgh, Pa.*
Palmolive-Peet Bldg.	*Chicago, Ill.*
Penna. Railroad Office Bldg.	*Philadelphia, Pa.*
Penobscot Bldg.	*Detroit, Mich.*
R. J. Reynolds Office Bldg.	*Winston Salem, N. C.*
San Francisco Stock Exchange	*San Francisco, Calif.*
Stone & Webster Bldg.	*New York, N. Y.*
Swift & Company (Main Office Bldg.)	*Chicago, Ill.*
Western Union Bldg.	*New York, N. Y.*
Wrigley Bldg.	*Chicago, Ill.*



The Empire State Building
New York

[Schreve, Lamb & Harmon, *Architects*
Meyer, Strong & Jones, *Engineers*
Baker Smith & Company, *Htg. and Vent. Contrs.*]

THE WORLD'S LARGEST BUILDING

The Merchandise Mart, Chicago
which includes the Chicago Studios of the National Broadcasting Company, is equipped throughout with American Air Filters, 1,312,000 C. F. M.

[Graham Anderson Probst & White, *Architects and Engineers*
H. B. Hayward Co., *Heating and Ventilating Contractors*]

INSURANCE COMPANIES—

appreciate the value of filtered air in maintaining health and personal efficiency. A partial list of the insurance companies that have equipped their buildings with American Air Filters:

Aetna Life Insurance Co.	*Hartford, Conn.*
Equitable Life of Iowa	*Des Moines, Iowa*
Liberty Mutual Ins. Co.	*Boston, Mass.*
Metropolitan Life Insurance Co.	*New York, N. Y.*
Mutual Benefit Life Ins. Co.	*Newark, N. J.*
New York Life Ins. Co.	*New York, N. Y.*
Northwestern Mutual Life Bldg.	*Milwaukee, Wis.*
Prudential Ins. Co. of America	*Newark, N. J.*
Travelers Insurance Co.	*Hartford, Conn.*
Western States Life Ins. Bldg.	*San Francisco, Calif.*

BUT WHY FILTER AIR?

Here is One Pound of Atmospheric Dust removed from ordinary city air—a constant menace to Health and Property.

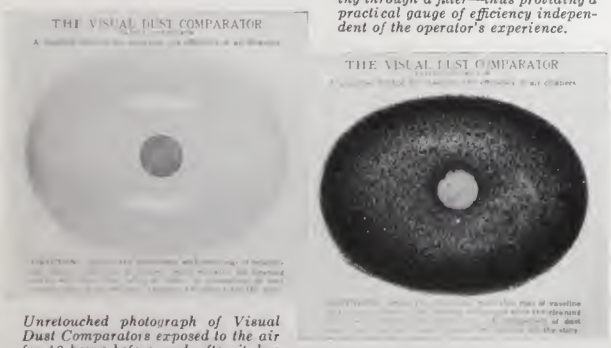
DUST-LADEN air is a menace. It damages costly machinery; sullies expensive decorations; deteriorates merchandise and furnishings; slows up the efficiency of workers and interferes with the comfort of customers.

The greater part of all atmospheric dust is invisible, but it is there at all times and in all places in quantities that are absolutely unbelievable. Only those who have made a study of air pollution can appreciate the large amount and the harmful nature of the solid impurities that constantly float in the air about us.

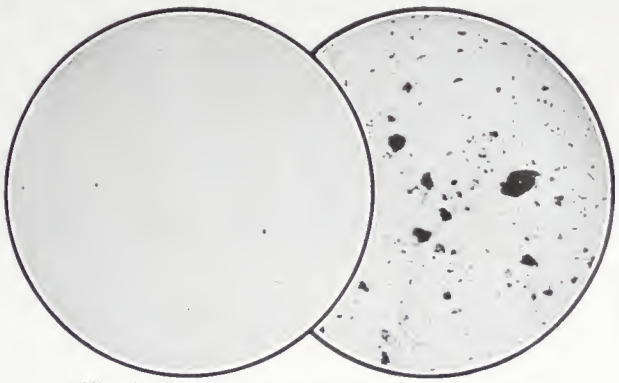
"If the myriad contents of the air were visible to our eyes", says Dr. E. Vernon Hill, eminent aerologist, "we would see the dust particles like tiny aeroplanes with microbes for pilots * * * the pollens of plants, street sweepings and soot * * * countless microscopic particles of matter, both living and dead."

These air-borne dust particles vary in size from the proverbial cinder which gets in one's eye to motes so small that several million would be required to cover the head of an ordinary pin. The average size is about one-half micron—roughly 1-50,000 of an inch.

This Visual Dust Comparator developed by our research engineers offers a simple and practical demonstration of filter efficiency in dust removal. The results secured with the comparator plainly show the dust content of the air before and after passing through a filter—thus providing a practical gauge of efficiency independent of the operator's experience.



Unretouched photograph of Visual Dust Comparators exposed to the air for 48 hours before and after it has passed through an American Multi-Panel Filter in a ventilating system. This test shows that over 99% of the dust and soot have been filtered out of the air.



Microphotographs showing how an American Air Filter removes dust from ordinary outside air—dust that is invisible to the naked eye but always present in large quantities.

ALL AIR CONTAINS DUST

EVEN in sections remote from civilization and as high in the air as man has been able to reach, atmospheric dust is found in appreciable quantities, while in cities and industrial centers a concentration of several hundred thousand dust particles per cubic foot is not uncommon.

Some idea of the dust concentration in New York City may be gained by the experiments of Professor H. H. Sheldon, New York University, who collected and measured the dirt recovered from the ventilating system of a theatre near Times Square. In one week 35 pounds of atmospheric dirt were filtered out of the air and, from this data, Professor Sheldon computed the dust concentration to be .8 grains per thousand cubic feet. On this basis it is estimated that from 8 to 10 tons of dust were suspended in the air over New York City at the time the experiments were made.

In the Chicago Loop District the dust concentration is approximately 1.1 grains per thousand cubic feet. Salt Lake City, reputed to be a clean city, has .38 grains per thousand cubic feet, an average of 40 observations made in connection with a smoke abatement investigation. The average concentration in cities is about .6 grains per thousand cubic feet of air. In steel mills and industrial plants, a dust concentration of from 2 to 2½ grains per thousand cubic feet is not unusual.

(Continued on Page 7)

J. L. Hudson Dept. Store, Detroit

[Smith, Hinchman & Grylls, Archts. & Engrs.
Carrier Engineering Corp., Air Conditioning.]

IN HOTELS—

The modern hotel provides filtered air in its lobbies, dining rooms, ball rooms and other assembly places—not only for the comfort of its patrons, but because of the marked savings in redecorating and refurnishing costs.

Barbizon Plaza Hotel	*New York, N. Y.*
Biltmore Hotel	*Los Angeles, Calif.*
Book Cadillac Hotel	*Detroit, Mich.*
Cleveland Hotel	*Cleveland, Ohio*
C. N. R. Hotel	*Vancouver, Canada*
Commodore Perry Hotel	*Toledo, Ohio*
Coronado Hotel	*St. Louis, Mo.*
Deshler Hotel	*Columbus, Ohio*
Edgewater Beach Hotel	*Chicago, Ill.*
Ford Hotel	*Detroit, Mich.*
Hotel Lincoln	*Indianapolis, Ind.*
Hotel Mallow Stuyvesant	*Wilkes Barre, Pa.*
Hotel Pierre	*New York, N. Y.*
Hotel Schroeder	*Milwaukee, Wis.*
Jung Hotel	*New Orleans, La.*
Kentucky Hotel	*Louisville, Ky.*
Mayflower Hotel	*Akron, Ohio*
Morrison Hotel	*Chicago, Ill.*
Hotel Royal Hotel	*Quebec, Canada*
Netherland Plaza Hotel	*Cincinnati, O.*
Palmer House	*Chicago, Ill.*
Park Plaza	*St. Louis, Mo.*
Pennsylvania Hotel	*New York, N. Y.*
Phillips Hotel	*Kansas City, Mo.*
Ritz Carlton Hotel	*Philadelphia, Pa.*
St. Francis Hotel	*San Francisco, Calif.*
St. George Hotel	*Brooklyn, N. Y.*
St. Regis Hotel	*New York, N. Y.*
Statler Hotel	*Detroit, Mich.*
Sovoy Plaza	*New York, N. Y.*

IN DEPARTMENT STORES—

Filtered air plays an important part in modern merchandising. It not only protects stocks and store interiors but creates a clean, healthful atmosphere for customers and employees.

Abraham & Straus	*New York, N. Y.*
Bamberger & Co.	*Newark, N. J.*
Block Dept. Store	*Indianapolis, Ind.*
Bon Marche	*Seattle, Wash.*
Bullock's	*Los Angeles, Cal.*
Carson, Pirie, Scott & Co.	*Chicago, Ill.*
Higbee Bros. Dept. Store	*Cleveland, Ohio*
John Wanamaker Co.	*New York, N. Y.*
John Wanamaker Co.	*Philadelphia, Pa.*
Jos. Horne Co.	*Pittsburgh, Pa.*
Julius Garfinkle Dept. Store	*Baltimore, Md.*
LaSalle & Koch	*Toledo, Ohio*
L. S. Ayres Co.	*Indianapolis, Ind.*
R. H. Macy Store	*New York, N. Y.*
Mandel Bros.	*Chicago, Ill.*
Marshall Field & Co.	*Chicago, Ill.*
Sears Roebuck & Company	*(15 Installations)*
Stewart & Co.	*Baltimore, Md.*
Strawbridge & Clothier	*Philadelphia, Pa.*
Titche Goettinger Co.	*Dallas, Texas*
Wm. Filene's Sons Co.	*Boston, Mass.*

Waldorf-Astoria Hotel, New York

[Schultze & Weaver, Architects
Clyde C. Place, Engineer
Thompson-Starrett Co., Inc., Bldg. & Year Contrs.]

BUT WHY FILTER AIR?

(Continued from Page 5)

A microscopic examination of a typical sample of this dust shows:

Smoke Carbons (soot)	45 - 47%
Silicous Matter	40 - 43%
Coal Dust	2½ - 3½%
Fibrous	3 - 4½%
Miscellaneous	6 - 8%

These percentages will vary in different localities and with the season, but they give some idea of the ratio of the various constituents that go to make up what is called "atmospheric dust". In almost every case half of the air pollution is soot.

TONS OF SOOT

The Mellon Institute has carried on extensive tests to determine the annual soot fall in Pittsburgh and other cities. Twelve sampling stations, located at various points throughout the residential, business and industrial districts, were carefully maintained and the quantity of soot collected at each station was accurately weighed. These tests showed that an average of 1950 tons of soot per square mile fell each month in the City of Pittsburgh.

It is estimated that the monthly soot fall in Baltimore is approximately 1530 tons; Chicago 1450 tons; Cleveland 700 tons; St. Louis 600 tons; Cincinnati 500 tons; and New York City 370 tons. Such figures are almost unbelievable until we stop to consider that about 50 pounds of smoke carbon and ash leave the chimney for every ton of coal consumed.

Dust and soot become grime and dirt—filtered air reduces the frequency of cleaning and the costly redecoration of building interiors.

It is apparent, therefore, that wherever air is used in large quantities for heating, ventilating, or air conditioning, adequate provision must be made for removing both dust and soot.

For example, a ventilating system supplying 12,000 cu. ft. of air per minute with a dust concentration of 1 grain per 1,000 cu. ft. (a little less than the dust concentration in the Chicago downtown district) would bring in one pound of dirt every ten hours. The cumulative effects of this volume of dust and soot entering a building each day would soon counteract any advantage that might be gained from the most scientific air conditioning.

SOOT THE GREATER PROBLEM

Soot is the most destructive element in modern ventilation. All dust is objectionable, but soot damages and *destroys*. Due to its greasy nature it is not easily wetted by water and tests show that it passes readily through "air washers" without any appreciable quantity being removed from the air. Apparently the only effect water sprays have upon it is to break up the large soot particles into a greater number of smaller ones, which tends to aggravate rather than improve conditions.

All dust, including soot, however, is susceptible to wetting with oil. The fact that dust particles adhere to oily surfaces and the use of oil to control dust on floors and roads is common knowledge. Based on this same principle, the viscous type air filter, using adhesive coated baffles to trap dust and soot, was introduced some ten years ago. The high efficiency of this method of removing dust and other solid impurities from the air has completely revolutionized the standards of air cleaning practice.

Tests made by one of the country's outstanding consulting engineers in a large industrial office building equipped with a complete modern air conditioning system showed the following results:

(Continued on Page 9)

Sterling Memorial Library, Yale University

[James Gamble Rogers, New York, N. Y., *Architect.*
Hollis French & Allen Hubbard, Boston, Mass., *Engineers.*
Libby, Blinn, Inc., Hartford Conn. *Htg. & Vent. Contrs.*]

IN LIBRARIES—

books are not only protected from dust and soot by filtered air but also from the sulphur in the air that attacks paper and bindings.

Ben Franklin Library *Philadelphia, Pa.*
Carnegie Library *Pittsburgh, Pa.*
Clark Library *Los Angeles, Calif.*
Cleveland Public Library *Cleveland, Ohio*
Detroit Public Library *Detroit, Mich.*
Folger Shakespeare Library *Washington, D. C.*
Grand Rapids Public Library *Grand Rapids, Mich.*
Hebrew Union College Library *Cincinnati, Ohio*
Library, University of Wyoming *Laramie, Wyo.*
Library, University of California *Berkeley, Calif.*
New York Public Library *New York, N. Y.*
Richmond Public Library *Richmond, Va.*
South Side Library *Milwaukee, Wisc.*
University of Washington Library *Seattle, Wash.*
Wm. H. Welch Medical Library (Johns Hopkins University) *Baltimore, Md.*

MUSEUMS AND ART GALLERIES—

need the protection of filtered air for the preservation of their invaluable contents, as evidenced by the fact that practically every well-known museum and art gallery in the country is equipped with American Air Filters.

Allyn Gallery of Art *New London, Conn.*
Art Institute of Chicago *Chicago, Ill.*
Art Museum *St. Louis, Mo.*
Bridges Art Museum *San Diego, Calif.*
Cleveland Museum of Art *Cleveland, Ohio*
Decorative Arts Bldg. *Chicago, Ill.*
De Young Memorial Museum *San Francisco, Calif.*
Fine Arts Bldg. *Chicago, Ill.*
Fine Arts Bldg. *Los Angeles, Calif.*
Ford Museum *Detroit, Mich.*
Field Museum of Natural History *Chicago, Ill.*
J. Pierpont Morgan Library *New York, N. Y.*
Memorial Art Museum *Louisville, Ky.*
Montclair Art Museum *Montclair, N. J.*
Natural Science Museum *Buffalo, N. Y.*
Toledo Museum of Art *Toledo, Ohio*
Wm. Rockhill Nelson Gallery of Art *Kansas City, Mo.*
Wash. Co. Museum of Fine Arts *Hagerstown, Md.*
Winchester Public Library *Boston, Mass.*
Worcester Art Museum *Worcester, Mass.*

Pennsylvania Museum of Art, Philadelphia, Pa.

[Berkley Hackett, *Engineer.*
Bulman Brothers, *Contractors.*]

BUT WHY FILTER AIR?

(Continued from Page 7)

Average Dust Content at Air Intake	22,530 particles
Average Dust Content leaving Air Washer	4,141 particles
Average Dust Content leaving Air Filter	179 particles
Efficiency of Air Filters (cleaning washed air)	95.6%

In this case the filter is cleaning washed air from which a part of the dust has already been removed. If placed in front of the washer it would unquestionably remove the dust now collected by the washer, in addition to that which it is removing from washed air, in which case its efficiency would be 99.2%.

FILTERED AIR—A MODERN NECESSITY

Formerly, air cleaning was considered only in connection with the ventilation of our larger and more expensive buildings. Today, the steady increase in air pollution, together with a better understanding of the importance of filtered air in the maintenance of health and personal efficiency, in the protection of building interiors and furnishings, and in the preservation of valuable merchandise and equipment, has extended its use to every type and size of building.

Because air filtration has proven the most economical, practical and efficient method of cleaning air, the modern air filter is now considered an absolute necessity in building ventilation or air conditioning.

Field Building (Marshall Field Estate) Chicago

[Graham, Anderson, Probst & White, *Architects and Engineers*
Wolff Brothers, *Heating and Ventilating Contractors*]

© Irving Underhill, Inc., N.Y.

Columbia Presbyterian Medical Center, New York

James Gamble Rogers, *Architect.*
Werner Nygren, *Engineer.*
Gillis & Geoghegan, *Htg. & Vent. Contrs.*

IN SCHOOLS AND COLLEGES—

Clean air is of paramount importance in schools and colleges where large groups of students are assembled in classrooms and study halls.

Alice Deal Jr. High School	*Washington, D. C.*
Balboa High School	*San Francisco, Calif.*
Brushton School	*Pittsburgh, Pa.*
Bryant Webster School	*Denver, Colo.*
California Acadamy of Science	*San Francisco, Calif.*
Central Junior High School	*Niagara Falls, N. Y.*
Collingswood Junior High School	*Collingswood, N. J.*
Cornell University	*Ithaca, N. Y.*
Folwell Jr. High School	*Minneapolis, Minn.*
Girard College	*Philadelphia, Pa.*
Harvard University	*Cambridge, Mass.*
Lincoln Jr. High School	*Milwaukee, Wisc.*
Louisiana State University	*New Orleans, La.*
Ohio State University	*Columbus, Ohio*
Roosevelt High School	*Washington, D. C.*
Rutgers University	*New Brunswick, N. Y.*
University of California	*Los Angeles, Calif.*
University of Chicago	*Chicago, Ill.*
Washington University	*St. Louis, Mo.*
Yale University	*New Haven, Conn.*

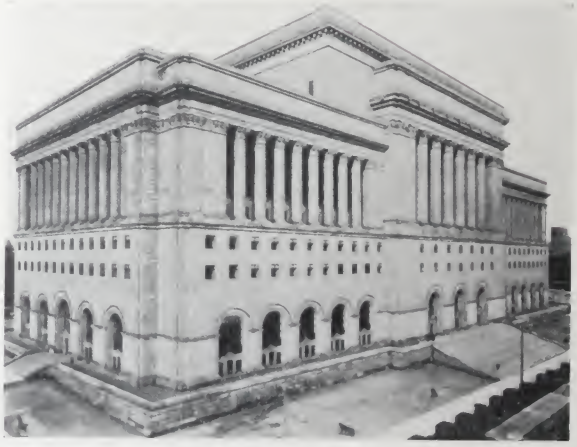
Crescent Hill Jr. High School, Louisville, Ky.

J. Meyrick Colley, *Architect.*
Warren & Ronald, *Engineers.*
H. Netherton & Co., *Contractors*

IN HOSPITALS—

Clean, filtered air is a vital necessity in hospitals where health is already below par. It is modern engineering's contribution to medicine in the never-ending fight against disease.

Allegheny General Hospital	*Pittsburgh, Pa.*
Battle Creek Sanatorium	*Battle Creek, Mich.*
Bellevue Hospital	*New York, N. Y.*
Buffalo City Hospital	*Buffalo, N. Y.*
Chicago Lying-In Hospital	*Chicago, Ill.*
Children's Hospital	*Denver, Col.*
Cornell Medical Center	*New York, N. Y.*
Fresno City Hospital	*Fresno, Calif.*
Harborview Hospital	*Seattle, Wash.*
Henry Ford Hospital	*Detroit, Mich.*
Indianapolis General Hospital	*Indianapolis, Ind.*
Johns Hopkins Hospital	*Baltimore, Md.*
Lakeside Hospital	*Cleveland, Ohio.*
Mayo Clinic	*Rochester, Minn.*
Metropolitan State Hospital	*Watham, Mass.*
Mt. Sinai Hospital Addition	*New York, N. Y.*
University Hospital	*Baltimore, Md.*
Wills Eye Hospital	*Philadelphia*



Milwaukee County Court House

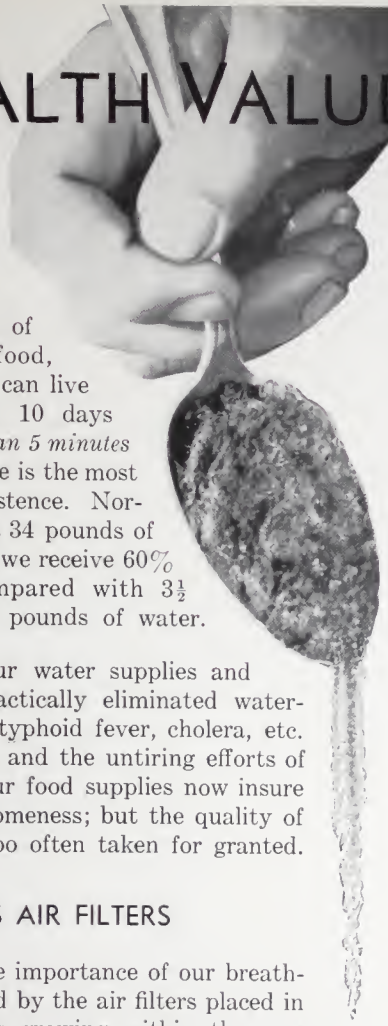
Albert Randolph Ross, *Architect.*
Wenzel & Henoch Co., *Htg. & Vent. Contrs.*

IN PUBLIC BUILDINGS—

filtered air not only protects contents and employees but adds to the comfort and reduces upkeep costs.

Administration Bldg.	*Cleveland, Ohio*
Administration Bldg.	*St. Louis, Mo.*
Berks County Court House	*Philadelphia, Pa.*
City Hall & Court House	*St. Paul, Minn.*
City of Detroit	*Detroit, Mich.*
Hudson County Court House	*Jersey City, N. J.*
Louisiana State Capitol	*Baton Rouge, La.*
Magistrate & Municipal Court House	*New York*
Racine County Court House	*Racine, Wisc.*
Soldiers & Sailors Memorial Bldg.	*Trenton, N. J.*
State Capitol	*Madison, Wisc.*
State Capitol Bldg.	*Nashville, Tenn.*
State Capitol	*Charleston, W. Va.*
United States Capitol	*Washington, D. C.*

The HEALTH VALUE OF FILTERED AIR



THE three essentials of human life are food, water and air. We can live 40 days without food, 10 days without water, *but less than 5 minutes without air.* Air therefore is the most vital element to our existence. Normally, we breathe about 34 pounds of air each day from which we receive 60% of our energy, as compared with 3½ pounds of food and 4 pounds of water.

Close supervision of our water supplies and sewage disposal has practically eliminated water-borne diseases, such as typhoid fever, cholera, etc. Government supervision and the untiring efforts of the manufacturers of our food supplies now insure their purity and wholesomeness; but the quality of the air we breathe is too often taken for granted.

NATURE'S AIR FILTERS

That Nature realizes the importance of our breathing clean air is evidenced by the air filters placed in our nostrils. The hairs growing within the nose form the filtering media through which the air is forced to pass before entering the lungs, and the mucous secretions provide a viscous coating on these hairs to trap the dust particles.

While Nature's filters may have afforded ample protection to man in his primitive state, they can no longer cope with increased dust concentration resulting from our crowded cities and greater industrial growth.

YOUR DAILY DOSE OF DIRT

It is estimated that the volume of air breathed every day by the average city dweller contains a tablespoonful of dust and dirt. Thus, while it may be true that we eat a peck of dirt in a life-time, few realize that they inhale many times that amount of dust and soot.

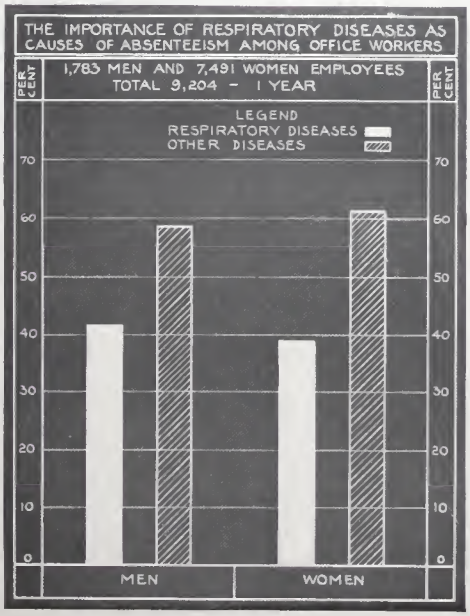
Your Daily Dose of DIRT!

Breathing dust-laden air is not only harmful to the tender membranes of the throat and lungs, but the germs and bacteria carried on the dust particles are an even greater menace to health. Tests made in the laboratories of the Massachusetts Institute of Technology under the direction of Murray P. Horwood, Ph. D., Associate Professor of Bacteriology and Public Health, show that one gram—approximately a thimbleful—of dust may contain as many as five million germs.

GERMS RIDE THE DUST PARTICLES

Such diseases as common colds, influenza, tuberculosis, diphtheria, whooping cough, and scores of others are usually transmitted by air-borne germs rather than through personal contact. A cough, a sneeze, the exhalations of ordinary conversation throw literally millions of disease germs into the air.

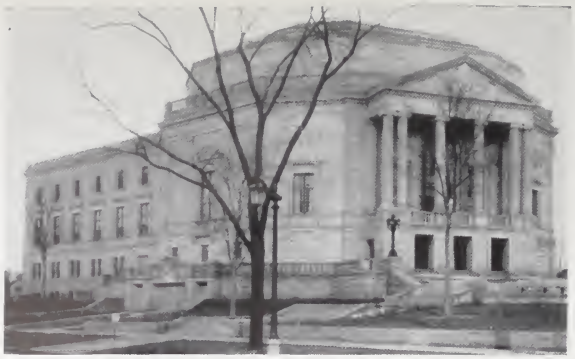
Most germs are heavier than air—relatively as heavy as an apple—and in perfectly clean air would quickly settle to the floor or ground where they could do little or no damage. Since air is not clean, however, many of the germs and bacteria that find their way into the atmosphere lodge upon dust particles and float for hours, awaiting the opportunity to attack an unsuspecting victim.



It is apparent, therefore, that the freer the air is from dust, the less chance there will be of spreading dust-borne diseases. This is particularly true in offices, factories, theatres, department stores, banks and other buildings where a large number of persons gather in close proximity.

The Medical profession has become very much concerned over the steady yearly increase in respiratory diseases. Dr.

(Continued on Page 13)



Severance Hall, Cleveland, Ohio

Walker & Weeks, *Architects.*
Clark, McMullen & Riley, *Engineers.*
Cooling & Air Conditioning Corp., *Air Conditioning.*

PUBLIC UTILITIES—

insist upon filtered air not only for the comfort and protection of their buildings but to safeguard the health of employees and to prevent undue wear on expensive machinery.

Atlantic City Electric Co.	*Atlantic City, N. J.*
Cleveland Electric Illuminating Co.	*Cleveland, Ohio*
Commonwealth Edison Co.	*Chicago, Ill.*
Detroit Edison Co.	*Detroit, Mich.*
Duquesne Light Co.	*Pittsburgh, Pa.*
City Light Building	*Seattle, Wash.*

South California Edison Co., Los Angeles

Allison & Allison, *Architects.*
Hunter & Hudson, San Francisco, *Engineers.*
Thomas Haverty Co., *Htg. & Vent. Contrs.*

IN THEATRES and AUDITORIUMS—

the comfort of the occupants is greatly increased by filtered air. Also, pure, clean air helps to prevent the spread of colds, influenza and other epidemic diseases.

Chicago Civic Opera	*Chicago, Ill.*
Chicago Theatre	*Chicago, Ill.*
Fountain Theatre	*Cincinnati, Ohio*
Fox Theatre	*Detroit, Mich.*
B. F. Keith Theatre	*Columbus, Ohio*
Keith Memorial Theatre	*Boston, Mass.*
Keith Theatre	*New York, N. Y.*
Metropolitan Opera House	*Philadelphia, Pa.*
Municipal Auditorium	*St. Louis, Mo.*
Paramount Theatre	*New York, N. Y.*

Fidelity National Bank, Kansas City, Mo.

Hart, Price & Barnes, *Architects.*
Thompson & Starrett, *Contractors.*

BANKS AND TRUST CO'S.—

know that filtered air pays cash dividends. They consider it a good investment.

American Bank	*New Orleans, La.*
Bank of California	*Tacoma, Wash.*
Bankers Trust Co.	*New York, N. Y.*
Chase National Bank	*New York, N. Y.*
Citizens & Southern National Bank	*Atlanta, Ga.*
Continental-Illinois Bank & Trust Co.	*Chicago, Ill.*
Equitable Trust Co.	*New York, N. Y.*
Federal Reserve Bank	*Cleveland, Ohio*
Federal Reserve Bank	*Kansas City, Mo.*
First National Bank	*Baltimore, Md.*
Framingham National Bank	*Boston, Mass.*
National City Bank	*New York, N. Y.*
Saving Fund Society	*Philadelphia, Pa.*

THE HEALTH VALUE OF FILTERED AIR

(Continued from Page 11)

Bundesen, Health Commissioner of Chicago, states that 60% more people are dying of respiratory diseases caused by contaminated air than all other diseases. The U. S. Weather Bureau, in cooperation with the Research Committee of the American Society of Heating and Ventilating Engineers, is conducting investigations in fourteen cities, in an endeavor to establish the exact relation of excessive atmospheric dust pollution to the abnormal prevalence of respiratory disorders.

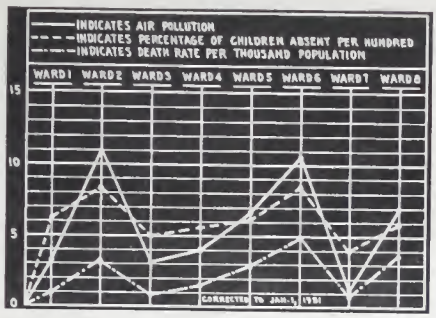


Chart prepared by the City of Akron, Ohio, showing relation of dust concentration to absenteeism and death rate.

ARE RESPIRATORY DISEASES AND DUST RELATED?

The City of Akron, Ohio, has made a careful study of air pollution and its bearing on sickness among school children. A record of the dust concentration in each section or ward of the city has been maintained over a period of two years, together with the number of school absentees and the total number of deaths. The results as shown by the chart above are of real interest, not only to the Medical profession, but to the public in general.

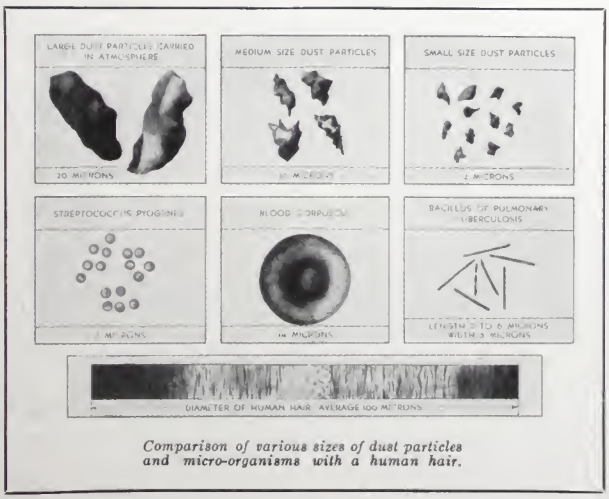
A large industrial insurance company estimates that the time lost by employees due to colds and other respiratory diseases is costing business and industry millions of dollars each year. This does not take into consideration the indirect losses resulting from the reduced efficiency of executives and department heads caused by the absence of assistants and secretaries, or the slowing up of production, the costly mistakes and the unavoidable waste due to inexperienced operators replacing key workers who are absent because of sickness.

HOW FILTERED AIR PROTECTS HEALTH

Tangible evidence of the beneficial effect of filtered air upon health is the relief it affords sufferers from seasonal hay-fever and asthma caused by invisible air-borne pollens. In many cases, almost immediate relief is experienced upon entering a room or building ventilated with filtered air. By spending ten to twelve hours out of twenty-four in filtered air, the disagreeable symptoms not only disappear but frequently the patients are able to go about their regular duties without feeling any discomfort. That these facts are recognized by the medical profession is evidenced by the number of hospitals that are now providing special wards supplied with pollen-free filtered air for the treatment of hay-fever and other respiratory diseases.

Since such results are possible with hay-fever and asthma, it stands to reason that filtered air should be equally effective, even though the benefits are not so apparent, in maintaining general health and personal efficiency.

When we stop to consider that almost ninety per cent of our lives are spent indoors, the importance of properly ventilating the buildings in which we live and work with filtered air can hardly be overemphasized.



Comparison of various sizes of dust particles and micro-organisms with a human hair.

Southwestern Bell Telephone Co., St. Louis, Mo.

I. R. Timlin, *Architect.*
N. O. Vegely, *Architectural Engineer.*
T. G. Hering, *Bldg. Engineer.*

TELEPHONE COMPANIES—

find filtered air essential in automatic exchanges to protect the delicate switching mechanism and insure trouble-free service. They also recognize the value of filtered air for Health and Efficiency of employees.

Bell Tel. Laboratories	*New York, N. Y.*
C. & P. Tel. Co.	*Charleston, W. Va.*
Cincinnati and Suburban Bell Tel. Co.	*Cincinnati, Ohio*
Grant Central Exchange	*Pittsburgh, Pa.*
Illinois Bell Tel. Co.	*Chicago, Ill.*
Indiana Bell Tel. Co.	*Indianapolis, Ind.*
International Tel. & Tel. Bldg.	*New York, N. Y.*
New England Tel. & Tel. Co.	*Boston, Mass.*
New York Tel. Co.	*New York, N. Y.*
Northwestern Bell Tel. Co.	*Minneapolis, Minn.*
Ohio Bell Tel. Co.	*Toledo, Ohio*
Southern Bell Tel. & Tel. Co.	*Louisville, Ky. and Atlanta, Ga.*
Southern Cal. Tel. Co.	*Los Angeles, Calif.*
Southwestern Bell Tel. Co.	*St. Louis and Kansas City, Mo.*

RESIDENCES—

The modern trend towards home air conditioning, which involves not only heating in the winter, but cooling in the summer, has focused attention upon the need for air filtration in the home.

Streaked walls, soiled draperies and ruined furnishings caused by soot and dirt have been eliminated in many homes by the addition of an air filter to the warm air heating system.

Air conditioning by Carrier Engineering Corporation

EVEN IN THE CAPITOL AT WASHINGTON—

Both the Senate and the House of Representatives, as well as the President's Executive Offices, enjoy filtered and conditioned air which insures Health and Comfort.

THE NEED FOR FILTERED AIR IN BUILDING VENTILATION AND AIR CONDITIONING

HUMAN comfort is largely dependent upon the condition of the air surrounding the body. The principal factors contributing to our comfort are temperature, humidity and air movement, but the purity and cleanliness of the air are of equal importance to our well being. Aside from personal health and comfort, however, the air used for ventilation or air conditioning must be cleaned to protect building interiors from dust and soot. Even in homes or buildings where all or a major part of the air is recirculated, the increase in dirt and soot during the heating season is quite noticeable.

LIMITATIONS OF AIR WASHERS

If an air washer is used for cooling or controlling the humidity it should not be depended upon to clean the air. The limitation of the air washer as an air cleaner long known to the engineering profession is now generally recognized. As far back as 1926, in an article published in the Journal of the American Society of Heating & Ventilating Engineers, one of the country's foremost air conditioning engineers stated, "It is a well known fact that spray type air washers will eliminate only about *50% of the carbon particles from the air, which necessitates the employment of some other method of dust removal.*" Thus, while air washers are still widely used in air conditioning service, it has become standard practice to include an efficient air filter to provide positive air cleaning.

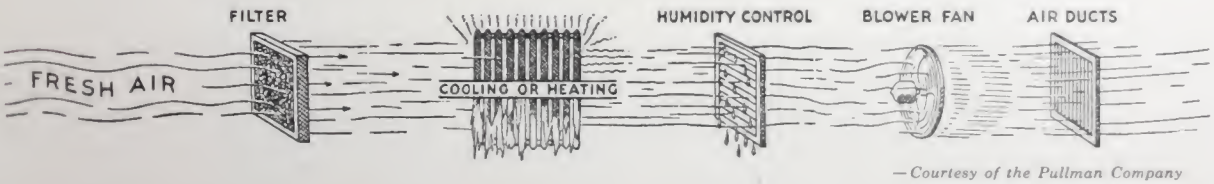
With any air conditioning system there are many days, especially in the Spring and Fall, when the outside temperature and humidity are ideal—making it unnecessary to "condition" the air in any way except to clean and distribute it. Since it costs almost 3 times as much to operate an air washer (not including refrigeration) than an automatic air filter of equal capacity, the saving made possible by eliminating the expense of operating the washer when it is not needed will materially affect the annual cost of operation for the entire system. In one case where careful records were kept of operating costs, it was found that the annual saving resulting from this method of operation represented a 19% return on the first cost of the air filter.

ECONOMY OF AIR FILTERS

Thus, while present atmospheric dust conditions necessitate cleaning the air, the savings effected by modern air filtration make it a real economy rather than an added expense. For that reason an air filter is now considered an essential part of any ventilating or air conditioning system. No well informed architect or engineer would think of designing a building today with mechanical ventilation or air conditioning without specifying suitable air filters. Companies specializing in air conditioning systems realize the need for positive air cleaning and include some type of air filter as a part of their systems. The manufacturers of warm air furnaces incorporate air filters as an integral part of their heating systems or domestic air conditioners.

The widespread use of air filters for building ventilation and air conditioning is due to their proven economy and high efficiency in the removal of all air-borne dust, including soot and bacteria. Filtered air has become a necessary requirement of our industrial, business and social life. Not only in this country, but in Europe, Canada, South America, Mexico, Japan, Australia and even in Soviet Russia, American Air Filters are furnishing clean air for man, machinery and materials.

AIR CONDITIONING GRAPHICALLY SHOWN, STEP BY STEP



—Courtesy of the Pullman Company

AIR FILTRATION—THE FIRST STEP IN AIR CONDITIONING

THE need for cleaning the air in heating, ventilating or air conditioning systems is no longer a debatable question. Experience has proved that the elimination of dust and soot from the air is necessary for the protection of building interiors, furnishings and occupants. Even where all or a major portion of the air is recirculated, the volume of lint and dust within the room or building makes cleaning essential.

For that reason an air filter is now recognized as a basic part of any air conditioning system. Its function is just as important to satisfactory operation as cooling, heating, humidity control or proper air distribution.

SELECTING THE AIR FILTER

Any filter properly designed for ventilating service will operate satisfactorily in an air conditioning system. There are certain requirements, however, such as the volume of air to be cleaned, degree of air cleanliness required, maximum allowable resistance, space available for the installation, maintenance facilities, and last but not least, cost of operation, which usually determines the type of filter best suited to the particular application.

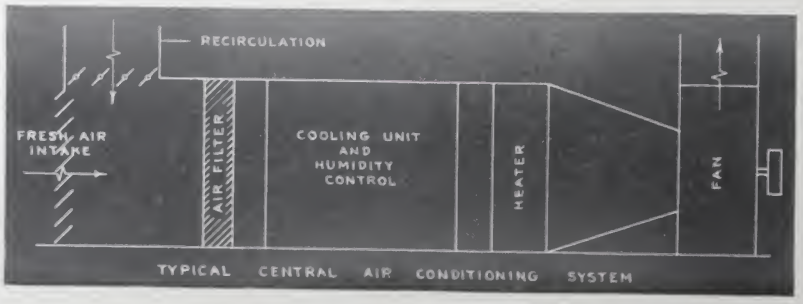
It should be remembered that the air filter is the one part of an air conditioning system that requires regular and systematic maintenance. For that reason serious thought should be given to the method and cost of maintenance as well as to the performance characteristics when selecting the filter. Clean air at minimum cost does not mean necessarily the cheapest filter that will answer the purpose, but the type that meets the requirement in the most economical manner.

The air filter may be located at any point in the air conditioning system, provided that all the air passes thru it before being distributed to the building. The most logical place for the filter, however, is at the air intake—the first step in air conditioning—in which position it serves also to protect the other equipment in the system, thus assuring constant performance at maximum efficiency.

COMPARATIVE OPERATING COSTS

Renewable type filters, introduced within the past few years have many desirable features which recommend them for domestic and commercial air conditioning. On the other hand, they have certain inherent limitations which must be recognized to assure their proper application. The principal one is the expense of maintenance due to replacing a complete unit each time the filter is serviced. Permanent filters, on the other hand, are higher in first cost, but their maintenance is almost negligible, since they are reconditioned by washing out the dirt and recoating with Viscosine. On the same basis the filter sheets for Airmat Type PL Units cost only a few cents, will remain in service from six weeks to two months. The cost of operating and maintenancing automatic self-cleaning filters is only a few cents per month, and requires practically no labor.

Automatic filters offer the additional advantage of constant performance—the air delivery does not vary as with manually maintenanced filters in which the resistance increases with the accumulation of dust and gradually reduces the volume of air—which assures uniform results at all times. Constant air volume is a most important factor in air conditioning and is the reason why automatic filters are used wherever practical on the larger systems. But, regardless of the type of filter used, it should be located at or near the source of the dust so that cleaning is the first step in conditioning the air.



THE ECONOMY OF FILTERED AIR

FILTERED AIR is a year 'round economy. It protects building interiors, furnishings and equipment; it reduces the cost of cleaning and redecorating, it creates a more healthful and inviting atmosphere in which to live or work, and increases patronage in those buildings which cater to the public.

1. *Reduces Frequency of Redecorating:* When dust and soot are deposited on interior walls they form unsightly grime and dirt which necessitates frequent cleaning or expensive redecoration. *A large hotel attributes a saving of approximately $3,000.00 a year in the cost of cleaning and refinishing lobby and dining rooms, and a department store claims that they need to redecorate only half as often, since American Air Filters were installed in their ventilating systems.*

2. *Reduces Cost of Cleaning and Dusting:* Cleaning and dusting are a daily necessity in many buildings. If the time and labor for this service can be reduced it will reflect in a lower operating cost for the building. *An art museum saves $3,285.00 each year in the cost of cleaning and dusting, and a school estimates that their dusting labor has been reduced 75% due to filtered air.*

3. *Safeguards Health:* Since there are so many more diseases that are air-borne than any other kind, the purity of the air we breathe is an important factor in our health. *An insurance company reports a 45% reduction in absence among employees due to sickness since moving into their new building which is well ventilated with filtered air. A decrease of 13.8% absenteeism in a school is attributed to proper ventilation with filtered air.*

4. *Increases Personal Efficiency:* Science tells us that 60% of our energy comes from the air we breathe. The lack of sufficient ventilation makes us tire quickly, causes headaches and generally contributes to lower efficiency. *There is no substitute for outdoor air if properly cleaned and conditioned for our comfort.*

5. *Protects Contents of Buildings:* Merchandise becomes shopworn and is sold at a loss; furnishings become soiled and must be cleaned or replaced; paintings are dulled; valuable books and museum pieces are deteriorated—all due to dust and soot. *Air filters prevent atmospheric dust from entering a building and thereby protect the contents as well as the occupants.*

SOME LARGE INDUSTRIAL USERS OF AMERICAN AIR FILTERS

ALUMINUM CO. OF AMERICA
AMERICAN ROLLING MILL CO.
AMERICAN SHEET & TIN PLATE CO.
AMERICAN SUGAR REFINING CO.
ANACONDA COPPER WIRE CO.
ANHEUSER BUSCH CO.
ATWATER KENT MFG. CO.
BETHLEHEM STEEL CO.
CAMPBELL SOUP CO.
CARNEGIE STEEL CO.
CELLULOID CORP.
CHEVROLET MOTOR CO.
R. R. DONNELLY & SONS
E. I. DUPONT DE NEUMOURS CO.
DUPONT PATHE FILM MFG. CO.
DUPONT RAYON CO.
EASTMAN KODAK CO.
ELI LILLY CO.
EMERSON DRUG CO.
FORD MOTOR CO.
FRASER PAPER CO.
FRIGIDAIRE CORP.
GENERAL ELECTRIC CO.
GREAT LAKES STEEL CO.
GRIGSBY GRUNOW CO.
(Majestic Radio)
GULF REFINING CO.
HAMMERMILL PAPER CO.
H. J. HEINZ CO.
ILLINOIS STEEL CO.
INTERNATIONAL HARVESTER CO.
INTERNATIOAL PAPER CO.
JONES & LAUGHLIN STEEL CO.
KRAFT PHENIX CHEESE CO.
LEVER BROS. (Lux)
MEAD JOHNSON CO.
NATIONAL BISCUIT CO.
NEW YORK CENTRAL R. R. CO.
OAKLAND MOTOR CAR CO.
PACKARD MOTOR CO.
PARKER PEN CO.
PENNA. RAILROAD CO.
PHOENIX HOSIERY CO.
PITTSBURGH PLATE GLASS CO.
PRATT & WHITNEY AIR CRAFT CORP.
PROCTER & GAMBLE CORP.
SILICA GEL CORP.
STANDARD BRANDS INC.
STEWART WARNER CORP.
SWIFT & CO.
TECHNICOLOR MOTION PICTURE CORP.
UNIVERSAL PORTLAND CEMENT CO.
VISCOSE CO.
WESTERN ELECTRIC CO.
WESTINGHOUSE ELEC. & MFG. CO.
WHEELING STEEL CORP.
YOUNGSTOWN SHEET & TUBE CO.

A WORD ABOUT THE
AMERICAN AIR FILTER COMPANY, INC.

The AMERICAN AIR FILTER COMPANY is not only the world's largest manufacturer of air cleaning equipment, but the recognized authority on dust problems and their satisfactory solution. The extent of its efforts to find new and improved methods or to develop more practical and serviceable equipment, is indicated by the 108 patents that it owns or controls and some 56 patent applications now pending. From its laboratories have come the most outstanding advancements in the air cleaning and dust control field.

In charge of AAF research are the engineers who developed and pioneered the viscous impingement method of cleaning air from an idea to the essential requirement that it is today. Their major contributions to dust control have been the original Viscous Unit Air Filter, introduced in 1920; the Automatic Viscous Air Filter in 1923; the Airmat Dry Filter in 1926; the Airmat Dust Arrester in 1927; the Roto-Clone in 1932, and more recently the Electro-Matic Self-cleaning Air Filter which combines electrical precipitation with automatic air filtration to obtain the maximum efficiency in the removal of atmospheric dust and smoke.

Products offered by the AMERICAN AIR FILTER COMPANY, INC., therefore embody the knowledge accumulated from nineteen years of intensive research devoted exclusively to the study of dust problems and the development of air cleaning apparatus; the experience gained from designing, building and applying thousands of air filters; are backed by ample technical and financial resources; and may be relied upon as the most modern equipment in their field of service.

The following Bulletins, Booklets and Performance Surveys covering American Air Filter products are available to those interested in special information or Engineering Data:

BULLETINS

No. 117-E AMERICAN FILTERS FOR WARM AIR HEATING AND DOMESTIC AIR CONDITIONING—
Throway, Renu, A/C-2, M/W-2, Wafer, etc.

No. 120-B AMERICAN FILTER FOR ENGINES AND COMPRESSORS

No. 130-A AMERICAN CYCOIL OIL BATH AIR CLEANER

No. 201-C AMERICAN VISCOUS UNIT FILTERS TYPES M/W AND R-D

No. 230-A AMERICAN AIRMAT DRY TYPE FILTERS TYPES PL AND NV

No. 240-C AMERICAN MULTI-PANEL AUTOMATIC AIR FILTER

No. 250 AMERICAN ELECTRO-MATIC AIR FILTER

No. 260-B AMERICAN AIRMAT DUST ARRESTER

No. 270-A ROTO-CLONE DYNAMIC PRECIPITATOR

PERFORMANCE SURVEYS

Ventilation and Air Conditioning

AIR FILTERS VS. AIR WASHERS

MULTI-PANEL FILTER (UNION TRUST CO., PITTSBURGH)

AIRMAT DRY TYPE FILTERS—(DULUTH PUBLIC SCHOOLS)

Industrial Applications

FINISHING ROOM (LARGE RADIO MFGR.)

MILL MOTOR VENTILATION (YOUNGSTOWN SHEET & TUBE CO.)

AIR COMPRESSOR-UNIT FILTER (BIG 4 R. R.)

AIR COMPRESSOR-AUTOMATIC FILTER (STUDEBAKER CORPORATION)

GAS ENGINES (OKLAHOMA NATURAL GAS COMPANY)

Process Dust Control

GOLD BUFFING (BAUSCH & LOMB OPTICAL COMPANY)

ASBESTOS FIBRES (GARLOCK PACKING)

GRINDER EXHAUST (ROTO-CLONE)

BOOKLETS

AIR FILTERS IN INDUSTRY—DESCRIBING AND ILLUSTRATING THE TEN MOST GENERAL AIR FILTER APPLICATIONS IN INDUSTRY.

DESIGNING AN AIR FILTER INSTALLATION—COVERING THE SELECTION, APPLICATION AND INSTALLATION OF AMERICAN AIR FILTERS.

THE APPLICATION OF AIR FILTERS TO PRODUCT FINISHING.

THE APPLICATION OF AIR FILTERS TO KITCHEN RANGE HOODS.

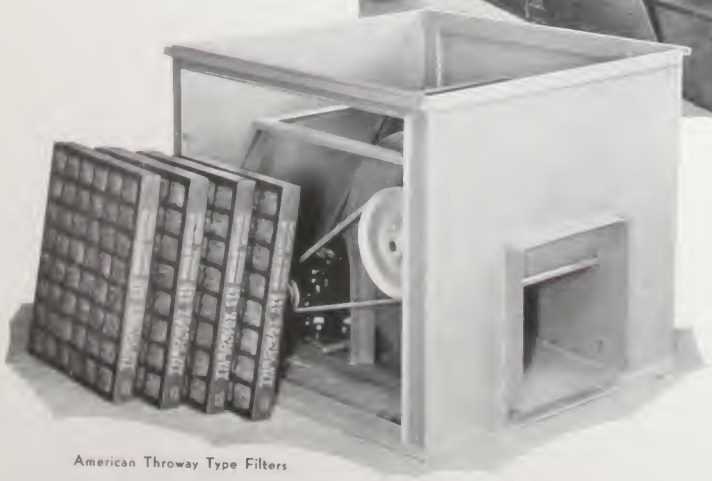
THE APPLICATION OF AIR FILTERS TO VENTILATION OF ELECTRICAL EQUIPMENT

TYPICAL INSTALLATIONS OF STANDARD TYPES OF AMERICAN AIR FILTERS

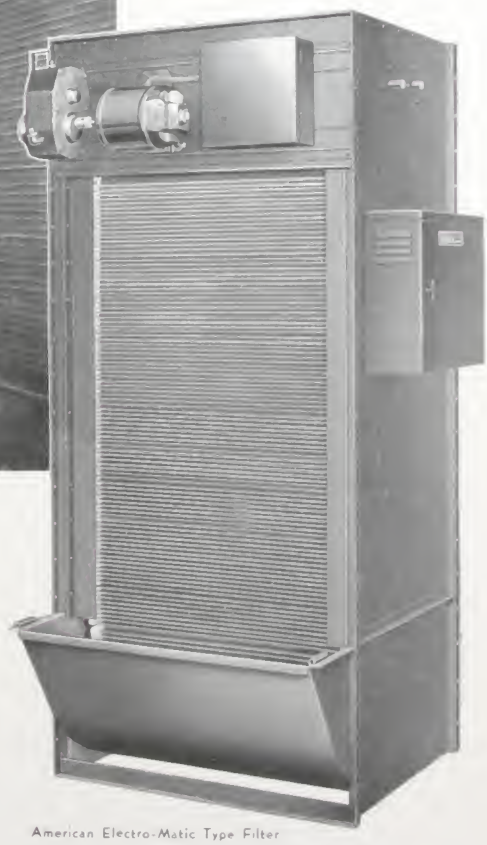
American Airmat Type PL Filter

American Unit Type Air Filter

American Multi-Panel Self-Cleaning Air Filter



American Throway Type Filters



American Electro-Matic Type Filter

A NATION WIDE ORGANIZATION AT YOUR SERVICE

ALBANY, N. Y.
320 Quail St.
Phone 2-3742

ATLANTA, GA.
428 Hurt Bldg.
Phone Jackson 2291

BALTIMORE, MD.
508 St. Paul St.
Phone Vernon 0111

BIRMINGHAM, ALA.
830 Martin Bldg.
Phone 3-3323

BOSTON, MASS.
201 Devonshire St.
Phone Liberty 1592

BRIDGEPORT, CONN.
991 Broad St.
Phone 3-6989

BUFFALO, N. Y.
800 Erie Co. Bank Bldg.
Phone Wash. 6384

CHARLOTTE, N. C.
305 Builders Bldg.
Phone 34481

CHATTANOOGA, TENN.
1301 Market St.
Phone 6-3625

CHICAGO, ILL.
228 N. LaSalle St.
Phone Randolph 6008

CINCINNATI, OHIO
1306 Chamber of Com. Bldg.
Phone Main 6829

CLEVELAND, OHIO
432 Bulkley Bldg.
Phone Main 4489

COLUMBUS, OHIO
202 S. Princeton
Randolph 3513

DALLAS, TEXAS
1305 Liberty Bank Bldg.
Phone 2-2388

DENVER, COL.
1228 California St.
Phone Tabor 4505

DES MOINES, IOWA
307 Securities Bldg.
Phone 4-6251

DETROIT, MICH.
802 Owens Bldg.
Phone Cadillac 3536

DULUTH, MINN.
316 Glencoe Bldg.
Phone Melrose 1358

HOUSTON, TEXAS
713 Bankers Mortgage Bldg.
Phone Preston 5196

HUNTINGTON, W. VA.
208 Hines Bldg.
Phone 21516

INDIANAPOLIS, IND.
Room 314-31 Georgia St.
Phone Lincoln 8848

KALAMAZOO, MICH.
2352 Midvale Terrace
Phone 29352

KANSAS CITY, MO.
405 E. 13th St.
Phone Victor 3958

KNOXVILLE, TENN.
702 Empire Bldg.
Phone 3-9219

LOS ANGELES, CALIF.
1978 S. Los Angeles St.
Phone PR. 4126

MEMPHIS, TENN.
912 Exchange Bldg.
Phone 8-2774

MILWAUKEE, WIS.
324 E. Wisconsin Ave.
Phone Daly 3350

MINNEAPOLIS, MINN.
2102 Foshay Tower
Phone Main 7842

NASHVILLE, TENN.
205 Church St.
Phone 6-7514

NEWARK, N. J.
24 Commerce St.
Phone Market 2-1777

NEW ORLEANS, LA.
4105 Elba St.
Phone Uptown 5889

NEW YORK, N. Y.
1620 Gr. Cent. Ter. Bldg.
Murray Hill 6-1634

OKLAHOMA CITY, OKLA.
122 E. Main St.
Phone 7-2571

OMAHA, NEB.
223 Barker Bldg.
Phone Jackson 5959

PHILADELPHIA, PA.
1700 Walnut St.
Phone Pennypacker 4426

PITTSBURGH, PA.
311 Ross St. Bldg.
Phone Atlantic 5085

PROVIDENCE, R. I.
P. O. Box 278
Phone Hopkins 2237

ROCHESTER, N. Y.
943 Granite Bldg.
Phone Main 2864

SAGINAW, MICH.
746 S. Fourth St.
Phone 2-3364

SALT LAKE CITY, UTAH
201 Bennett Bldg.
Phone Wasatch 1000

SAN ANTONIO, TEXAS
3005 Smith Young Tower
Phone Fannan 9581

SAN FRANCISCO, CALIF.
598 Monadnock Bldg.
Phone Douglass 3193

SEATTLE, WASH.
1411 Fourth Ave. Bldg.
Phone Eliot 6663

SPRINGFIELD, MASS.
40 High Street
Phone 2-8815

ST. LOUIS, MO.
1605 Syndicate Trust Bldg.
Phone Garfield 1626

SYRACUSE, N. Y.
432 Buckingham Ave.
Phone 6-1168

TACOMA, WASH.
506 Tacoma Bldg.
Phone Main 4281

TOLEDO, OHIO
1922 Linwood Ave.
Phone Main 2101-2

TULSA, OKLA.
718 Nat. Bank of Tulsa Bldg.
Phone 4-1101

WASHINGTON, D. C.
401 Hill Building
Phone District 4318

AMERICAN AIR FILTER CO., Inc.

INCORPORATED

LOUISVILLE, KENTUCKY

FORM 501—60M-3-39

PRINTED IN U. S. A.